UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,037	11/19/2003	Siddhartha Nandi	VRT0091US	7317

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CAMPBELL STEPHENSON ASCOLESE, LLP
4807 SPICEWOOD SPRINGS RD.
BLDG. 4, SUITE 201
AUSTIN, TX 78759

EXAMINER
KING, JUSTIN

ART UNIT	PAPER NUMBER
2111	

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/717,037	NANDI ET AL.
	Examiner	Art Unit	
	Justin I. King	2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>17 October 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-36</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/19/03, 4/20/04</u>.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim 15 recites the identical limitations as claimed in the parent claim 14.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3.   The claimed invention in claims 29-36 is directed to non-statutory subject matter. Claims are not limited to tangible embodiments. Claims 29-36 claim a computer readable medium being a communications medium conveying signals encoding the instructions (claim 29, preamble). In view of Applicant's disclosure, the communication medium is not specified to preclude any intangible embodiments; therefore, the communication medium can be defined as including both tangible embodiments (e.g., physical connecting cable) and intangible embodiments (e.g., carrier wave). As such, the claims are not limited to statutory subject matter only and are therefore non-statutory.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

6.   Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted

prior art and Koclanes et al. (U.S. Pub. No. 2004/0243699).

Referring to claim 1: The admitted prior art discloses a system comprising a storage

device discovery module (figure 2, structures 133 and 143, VERITAS Volume Manager,

November, 2001) configured to determine information about at least one storage device

belonging to a distributed computing system, and a multipath driver (figure 2, structures 135 and

145) in communication with the storage device discovery module and configured to direct

input/output (I/O) operations along at least one of a plurality of communication pathways (figure

2, structures 181 and 186) to the at least one storage device (figure 2, structures 191-195). The

admitted prior art discloses a host (figures 1-2, structures 130 and 140), which inherently

includes processor and memory. The admitted prior art does not disclose or teach a device
policy module.

Koclanes discloses a policy-based management of storage resources (abstract). Koclanes
discloses a set of service level objectives driven by policy rules (paragraph 36). Koclanes
discloses receiving a request to load a device policy module into a memory (paragraph 17),
wherein the device policy module is for use by a device driver (paragraph 37), and wherein the
device policy module includes at least one of a function, a procedure, and an object-oriented
method operable to perform at least one of input/output (I/O) operation scheduling, path
selection, and I/O operation error analysis; loading the device policy module into the memory;
and registering the device policy module with the device driver. Koclanes teaches one to
increase the conventional system's scalability and performance with the policy-based
management (paragraph 6). Hence, it would have been obvious to one having ordinary skill in
the computer art at the time Applicant made the alleged invention to adapt Koclanes' policy-
based management onto the admitted prior art because Koclanes teaches one to increase the
conventional system's scalability and performance with the policy-based management.

Referring to claim 2: Koclanes discloses a business-oriented policy (paragraph 37), which
is a user application.

Referring to claim 3: Each host has an operation system, and the kernel is the core of the
operation system; thus, the memory used to support the operation system is the claimed kernel
memory.

Referring to claim 4: Koclanes discloses a set of policies (paragraph 17); and associated
process to invoke these policies is the claimed registering the device policy module with the

device driver by calling at least one of a function, a procedure, and an object-oriented method associated with the device driver.

Referring to claim 5: Koclanes discloses a detection of an out-of-bound condition and applying an alternative policy (paragraph 18), which are equivalent to the claimed determining whether the device policy module is currently present in the memory.

Referring to claim 6: The admitted prior art discloses a practice of the A/P array (Specification, paragraph 7). The admitted prior art discloses that it is known to detect the unavailability of the physical resources. When the physical resource is unavailable, the related policy cannot be carried out, thus, the policy module is not available.

Referring to claim 7: Both the admitted prior art and Kolanes disclose an alternative path when the primary path fails; the process of releasing the request for the primary path is equivalent to the claimed un-registering the device policy module with the device driver by calling at least one of a function, a procedure, and an object-oriented method associated with the device driver.

Referring to claim 8: The admitted prior art's Volume Manager comprises transmitting at least one storage device attribute to the device driver.

Referring to claim 9: Koclanes discloses that the at least one of a function, a procedure, and an object-oriented method of the device policy module is specific to a particular storage device (paragraph 37).

Referring to claim 10: Koclanes discloses that the at least one of a function, a procedure, and an object oriented method operable to perform at least one of I/O operation scheduling, path selection, and I/O operation error analysis performs at least one of: select one of the plurality of

communication pathways to the at least one storage device; select one or more sub-devices of the

at least one storage device which will be affected due to a communication pathway failure; select

an alternate communication pathway in case of a failure of one of the plurality of communication

pathways (paragraph 18); effect a communications pathway changeover; respond to respond to

SCSI reservation/release requests; and selectively transmit I/O operations along at least two of

the plurality of communication pathways to the at least one storage device.

Referring to claim 11: Koclanes discloses a detection of an out-of-bound condition

(paragraph 18), which is equivalent to the claimed monitoring at least one loaded device policy

module.

Referring to claim 12: The admitted prior art's Volume Manager discovers the presence

of at least one storage device belonging to a distributed computing system.

Referring to claim 13: Koclanes discloses determining whether the at least one storage

device has a corresponding device policy module (paragraph 19).

Referring to claims 14-15 and 21: The admitted prior art discloses a system comprising a

storage device discovery module (figure 2, structures 133 and 143, VERITAS Volume Manager,

November, 2001) configured to determine information about at least one storage device

belonging to a distributed computing system, and a multipath driver (figure 2, structures 135 and

145) in communication with the storage device discovery module and configured to direct

input/output (I/O) operations along at least one of a plurality of communication pathways (figure

2, structures 181 and 186) to the at least one storage device (figure 2, structures 191-195). The

admitted prior art does not disclose or teach a device policy module.

Koclanes discloses a policy-based management of storage resources (abstract). Koclanes discloses a set of service level objectives driven by policy rules (paragraph 36), which is equivalent to the claimed object-oriented method operable to perform at least one of I/O operation scheduling, path selection, and I/O operation error analysis. Koclanes teaches one to increase the conventional system's scalability and performance with the policy-based management (paragraph 6). Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the alleged invention to adapt Koclanes' policy-based management onto the admitted prior art because Koclanes teaches one to increase the conventional system's scalability and performance with the policy-based management.

Referring to claim 16: Koclanes discloses that the at least one of a function, a procedure, and an object-oriented method of the device policy module is specific to a particular storage device (paragraph 37).

Referring to claim 17: Koclanes discloses that the at least one of a function, a procedure, and an object oriented method operable to perform at least one of I/O operation scheduling, path selection, and I/O operation error analysis performs at least one of: select one of the plurality of communication pathways to the at least one storage device; select one or more sub-devices of the at least one storage device which will be affected due to a communication pathway failure; select an alternate communication pathway in case of a failure of one of the plurality of communication pathways (paragraph 18); effect a communications pathway changeover; respond to respond to SCSI reservation/release requests; and selectively transmit I/O operations along at least two of the plurality of communication pathways to the at least one storage device.

Referring to claim 18: The admitted prior art discloses disk (figure 1, structure 180).

Referring to claim 19: The admitted prior art discloses a host (figures 1-2, structures 130 and 140), which inherently includes processor and memory.

Referring to claim 20: Each host has an operation system, and the kernel is the core of the operation system; thus, the memory used to support the operation system is the claimed first portion of the memory. The admitted prior art discloses an Application (figure 1, structures 131 and 141); the memory used to support the Application is the claimed second portion of the memory.

Referring to claim 22: Koclanes discloses reconfiguring the network with alternative device policy (paragraphs 17-18), which is equivalent to the claimed registering a device policy module.

Referring to claim 23: Koclanes discloses a detection of an out-of-bound condition (paragraph 18), which is equivalent to the claimed monitoring at least one loaded device policy module.

Referring to claims 24 and 28: Koclanes discloses selecting and switching different policy (paragraphs 17-18), which is equivalent to the claimed configured to receive at least one of a request to load a device policy module and a request to unload a device policy module.

Referring to claim 25: The admitted prior art includes a Volume Manager, which includes the information about at least one storage device includes at least one device attribute and wherein the device discovery module is further configured to transmit the information about at least one storage device to the multipath driver.

Referring to claim 26: The admitted prior art includes a Volume Manager, which includes the at least one device attribute includes at least one of: a number of paths to the device, primary

path information, secondary path information, connected path information, disconnected path

information, vendor information, an enclosure serial number, and an LUN serial number, an

array type.

Referring to claim 27: The admitted prior art includes a Volume Manager, which includes

configuring to transmit the information about at least one storage device to the multipath driver.

Referring to claim 29: The admitted prior art discloses a system comprising a storage

device discovery module (figure 2, structures 133 and 143, VERITAS Volume Manager,

November, 2001) configured to determine information about at least one storage device

belonging to a distributed computing system, and a multipath driver (figure 2, structures 135 and

145) in communication with the storage device discovery module and configured to direct

input/output (I/O) operations along at least one of a plurality of communication pathways (figure

2, structures 181 and 186) to the at least one storage device (figure 2, structures 191-195). The

admitted prior art discloses a host (figures 1-2, structures 130 and 140), which inherently

includes processor and memory. The admitted prior art does not disclose or teach a device

policy module.

Koclanes discloses a policy-based management of storage resources (abstract). Koclanes

discloses a set of service level objectives driven by policy rules (paragraph 36). Koclanes

discloses receiving a request to load a device policy module into a memory (paragraph 17),

wherein the device policy module is for use by a device driver (paragraph 37), and wherein the

device policy module includes at least one of a function, a procedure, and an object-oriented

method operable to perform at least one of input/output (I/O) operation scheduling, path

selection, and I/O operation error analysis; loading the device policy module into the memory;

and registering the device policy module with the device driver. Koclanes teaches one to

increase the conventional system's scalability and performance with the policy-based

management (paragraph 6). Hence, it would have been obvious to one having ordinary skill in

the computer art at the time Applicant made the alleged invention to adapt Koclanes' policy-

based management onto the admitted prior art because Koclanes teaches one to increase the

conventional system's scalability and performance with the policy-based management.

Referring to claim 30: Koclanes discloses business-oriented policy (paragraph 37), which

is a user application.

Referring to claim 31: Each host has an operation system, and the kernel is the core of the

operation system; thus, the memory used to support the operation system is the claimed kernel

memory.

Referring to claim 32: Koclanes discloses selecting and loading the device policy

(paragraph 17), which is equivalent to the claimed calling at least one of a function, a procedure,

and an object-oriented method associated with the device driver.

Referring to claim 33: Koclanes discloses a detection of an out-of-bound condition

(paragraph 18), which is equivalent to the claimed determining whether the device policy module

is currently present in the memory.

Referring to claim 34: Koclanes discloses that the at least one of a function, a procedure,

and an object-oriented method of the device policy module is specific to a particular storage

device (paragraph 37).

Referring to claim 35: Koclanes discloses that the at least one of a function, a procedure,

and an object oriented method operable to perform at least one of I/O operation scheduling, path

selection, and I/O operation error analysis performs at least one of: select one of the plurality of

communication pathways to the at least one storage device; select one or more sub-devices of the

at least one storage device which will be affected due to a communication pathway failure; select

an alternate communication pathway in case of a failure of one of the plurality of communication

pathways (paragraph 18); effect a communications pathway changeover; respond to respond to

SCSI reservation/release requests; and selectively transmit I/O operations along at least two of

the plurality of communication pathways to the at least one storage device.

Referring to claim 36: Koclanes discloses a detection of an out-of-bound condition

(paragraph 18), which is equivalent to the claimed monitoring at least one loaded device policy
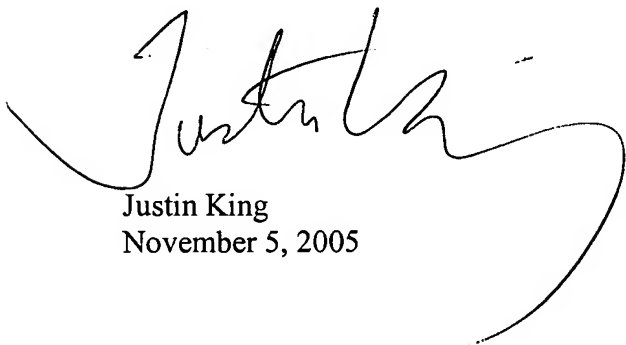
module.

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Justin I. King whose telephone number is 571-272-3628. The

examiner can normally be reached on Monday through Friday, 9:00 am to 5:00 pm. If attempts

to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen

can be reached on 571-272-3676 or on the central telephone number, (571) 272-2100. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-

8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
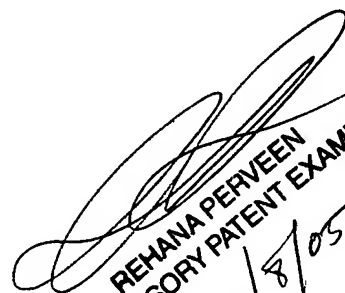
applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will

cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign

patents and non-patent literature will continue to be included with office actions. These cited

U.S. patents and patent application publications are available for download via the Office's

PAIR. As an alternate source, all U.S. patents and patent application publications are available

on the USPTO web site (www.uspto.gov), from the Office of Public Records and from

commercial sources. Applicants are referred to the Electronic Business Center (EBC) at

http://www.uspto.gov/ebc/index.html or 1-866-217-9197 for information on this policy. Requests

to restart a period for response due to a missing U.S. patent or patent application publications

will not be granted.

Justin King
November 5, 2005